TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT NO. 71633

Excelsior Mining JCM, Inc.

I. INTRODUCTION

This Class II air quality permit is issued to Excelsior Mining JCM, Inc., the Permittee, for the continued operation of the Johnson Camp Mine located approximately 65 miles east of Tucson in Cochise County near Dragoon, Arizona. This permit is a renewal of Air Quality Permit #57694.

A. Company Information

1.	Facility Name:	Johnson Camp Mine
2.	Facility Location:	Approximately 65 miles east of Tucson In Cochise County near Dragoon, Arizona Latitude: 32˚ 5’ 59” N. Longitude: 110˚ 4’ 9.5” W.
3.	Mailing Address:	2999 N. 44th St., Suite 300 Phoenix, Arizona 85018

B. Background

The Johnson Camp Mine, operated by Excelsior Mining JCM Inc., is primarily an open-pit copper mine and plated copper production facility. Copper is extracted via chemical leaching processes, and then electroplated onto stainless steel blanks and removed for further processing and sale.

C. Attainment Classification

The Dragoon area is attainment or unclassified for all criteria pollutants.

D. Minor Permit revision 63302

Minor Permit Revision No. 63302 removes authorization for all mining and ore processing activities (such as drilling, blasting, hauling, crushing, screening, conveying, stock piling, etc.) other than operation of the solvent extraction and electrowinning process. This minor permit revision also includes the installation and operation of evaporator equipment to enhance the natural evaporation of the draindown/pregnant leach solution.

Decommissioning of the mining and ore processing operations results in a facility-wide potential to emit less than the major source threshold, thus this minor permit revision changes the category of the permit from a Class II Synthetic Minor to a Class II Permit.

E. Minor Permit Revision No. 65078

This minor permit revision authorizes Excelsior Mining JCM, Inc. to update the permitted solution extraction (SX) mixer/settler units and electrowinning (EW) cell block capacity. The changes in capacity (square footage) is based on the revised on-site engineering measurements at Johnson camp mine facility. The equipment list on Attachment “C” of the

permit is updated to reflect these changes.

F. Permit Renewal #71633

This permit renewal authorizes Excelsior Mining JCM, Inc. to replace the existing propane fired 2.5 MMBtu/hr Electrolyte Heaters (HTR-1 and HTR-2) with new natural gas fired 8.3 MMBtu/hr Electrolyte Heaters (HTR-3 and HTR-4). The permit renewal also removes the heaters operation restriction contained in Permit 57694, The equipment list on Attachment "C" of the permit is updated to reflect these changes.

II. PROCESS DESCRIPTION

A. Processes

SX/EW Plant - At the SX/EW plant, the PLS is pumped to an extraction mixer/settler tank where it is mixed with an organic solution similar to kerosene. When the organic solution mixes with the PLS, the copper is transferred to the organic solution. The mixture is allowed to settle and the copper laden organic solution floats to the top of the tank. The organic solution is pumped from the top of the extraction mixer/settler tank to a stripping mixer/settler tank. The organic solution is mixed with a strong sulfuric acid mixture (electrolyte) and the copper is transferred to the electrolyte. After being allowed to separate, the copper laden electrolyte is pumped to the electrowinning tankhouse. The tankhouse is comprised of many individual cells which each contain many blank stainless steel cathodes. When electricity is applied to the cathodes, pure copper begins to plate onto the stainless steel. After several days the cathodes are removed and a large plate of copper is pried from the stainless steel.

Draindown Pond Evaporators and Heap Leach Evaporative Sprays – Historic operations at JCM developed pregnant leach solution (PLS) rich with copper for copper extraction. Most of the remaining liquid is non-copper bearing liquids. JCM is reducing the remaining liquid stock using various mechanisms including evaporators on the existing PLS storage ponds to enhance the existing natural evaporation in the ponds.

JCM operates multiple evaporative vertical spray nozzles at the heap leach pad to facilitate the evaporation of PLS at the heap leach area and reduce PLS accumulation at the storage ponds.

Electrolyte Heaters – JCM currently operates two propane fired 2.5 MMBtu/hr electrolyte heaters to support SX/EW operations. JCM will replace those two heaters with 2 natural gas fired 8.3 MMBtu/hr electrolyte heaters.

Gasoline Storage Tank – A 1,000 gallon gasoline storage tank is located at JCM for fueling fleet vehicles.

B. Control Devices

Dilute sulfuric acid applied to the ore during the heap leaching process is done so by using large droplets close to the ground or via wobbler or buried surface emitters in order to eliminate acid mist emissions into the atmosphere.

The mixers, settlers, and various other tanks containing organic solution utilized during the SX process are covered to minimize evaporative losses of VOCs and HAPs.

An acid mist suppressing agent and tarps over the EW cells are used to control sulfuric acid emissions from electrowinning and to limit evaporative losses. Other effective methods may be used as indicated in the permit.

III. EMISSIONS

Emissions from this facility are the result of, the natural gas electrolyte heaters, the SX/EW process, the draindown pond evaporators and heap leach evaporative sprays, and the gasoline storage tank. Table 1 below provides the facility's Potential to Emit (PTE). Information on fugitive emissions can be found in the permit application.

Table 1: Potential Emissions (for non-fugitive emissions)

Pollutant	Emissions (tons per year)
PM	9.18
PM_{10}	9.18
$PM_{2.5}$	7.66
NO_x	7.13
CO	5.99
SO_2	0.04
VOC	4.29
GHG (expressed as CO_2e)	8,557
HAPs	2.07

IV. APPLICABLE REGULATIONS

Table 2 displays the applicable requirements for each permitted piece of equipment along with an explanation of why the requirement is applicable.

Table 2: Verification of Applicable Regulations

Unit	Control Device	Rule	Verification
Electrolyte Heaters	N/A	A.A.C. R18-2-724.C.1 A.A.C. R18-2-724.J	These standards apply to fossil fuel fired industrial equipment rated at between .5 MMBTU/hr and 250 MMBTU/hr in which the products of combustion do not come into direct contact with process materials.

Unit	Control Device	Rule	Verification
Solvent Extraction / Electrowinning Process	Covers on tanks; Dispersion balls or equivalent method to control acid emissions	A.A.C. R18-2-730.D A.A.C. R18-2-730.F A.A.C. R18-2-730.G	These standards apply to unclassified sources.
Gasoline Dispensing Facility	Submerged filling device; Pump / compressor seals	40 CFR Part 63 Subpart CCCCCC A.A.C. R18-2-710	These standards apply to each gasoline dispensing facility (GDF) that is located at an area source of hazardous air pollutants (HAPs) as defined in NESHAP Subpart CCCCCC. These standards apply to existing storage vessels for petroleum liquids.
Fugitive dust sources	Water Trucks; Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; and other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	These standards are applicable to any spray painting operation.
Demolition/renovation operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.

V. PREVIOUS PERMIT CONDITIONS

Permit No. 57694 was issued on December 18, 2013, for the operation of this facility. Table 3 below illustrates if a section in Permit No. 57694 was revised, kept, or deleted.

Table 3: Permit No. 57694

Section No.	Determination			Comments
	Revised	Keep	Delete	
Att. A.	X			General Provisions - Revised to represent most recent template language.

Section No.	Determination			Comments
	Revised	Keep	Delete	
Att. B Section I	X			Operating limitations on unpaved roads and blasting removed in MPR 63302. Dust control plan removed in 63302.
Att. B Section II			X	Removed via MPR 63302
Att. B Section III			X	Removed via MPR 63302
Att. B Section IV	X			Now section III
Att. B Section V	X			Now Section II
Att. B Section VI	X			Now section V
Att. B Section VII	X			Now section VI. Revised to reflect the most recent permitting language.
Att. B Section VIII			X	Mobile sources removed from current permits
Att. B Section IX	X			Now section VII. Revised to reflect the most recent permitting language.
Att. C	X			Revised to reflect the most recent equipment operating at the facility and to include equipment information provided.

VI. MONITORING AND RECORDKEEPING REQUIREMENTS

A. Facility Wide

1. Along with the semiannual compliance certification, the Permittee is required to submit reports of all recordkeeping, monitoring and maintenance required by the permit.

2. The Permittee is required to maintain, on-site, records of the manufacturer's specifications or an Operation and Maintenance Plan for all equipment listed in the permit.

B. Solvent Extraction / Electrowinning (SX/EW) Process

The Permittee is required to maintain a record of all control measures used to limit emissions from the SX/EW process.

C. Gasoline Dispensing Facility

1. The Permittee is required to maintain a file of the typical Reid vapor pressure of

the gasoline stored in the tank, dates of storage in the tank, and of dates when the storage tank is empty.

2. The Permittee is required to maintain records of monthly throughput of gasoline (total volume of gasoline that is loaded into, or dispensed from, the gasoline storage tank during a month). The Permittee must have these records available within 24 hours of a request by the Director or the Administrator to document gasoline throughput. These records should be kept for a period of 5 years.

3. The Permittee is required to determine and record the average monthly storage temperature and true vapor pressure of the gasoline stored at such temperature if either:

   a. The gasoline has a true vapor pressure, as stored, greater than 26 mm Hg (0.5 psia) but less than 78 mm Hg (1.5 psia) and is stored in a tank other than one equipped with a floating roof, a vapor recovery system or their equivalents; or

   b. The gasoline has a true vapor pressure, as stored, greater than 470 mm Hg (9.1 psia) and is stored in a tank other than one equipped with a vapor recovery system or its equivalent.

D. Fugitive Dust

1. The Permittee is required to keep record of the dates and types of dust control measures employed.

2. The Permittee is required to show compliance with the opacity standards by having a Method 9 certified observer perform a monthly survey of visible emission from fugitive dust sources. The observer is required to conduct a 6-minute Method 9 observation if the results of the initial survey appear on an instantaneous basis to exceed the applicable standard.

3. The Permittee is required to keep records of the name of the observer, the time, date, and location of the observation and the results of all surveys and observations.

4. The Permittee is required to keep records of any corrective action taken to lower the opacity of any emission point and any excess emission reports.

E. Periodic Activities

1. The Permittee is required to record the date, duration and pollution control measures of any abrasive blasting project.

2. The Permittee is required to record the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.

3. The Permittee is required to maintain records of all asbestos related demolition or renovation projects. The required records include the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.

VII. COMPLIANCE HISTORY

This facility was not inspected during the five year term of Permit No. 56794. There were no deviations due to environmental impacts.

VIII. LIST OF ABBREVIATIONS

A.A.C. ..... Arizona Administrative Code
ADEQ ..... Arizona Department of Environmental Quality
AQD ..... Air Quality Division
ARS ..... Arizona Revised Statutes
cfm ..... Cubic Feet per Minute
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
CO_2e ..... Carbon Dioxide Equivalent
dscm ..... Dry Standard Cubic Meter
dscf ..... Dry Standard Cubic Foot
ft ..... Feet
GDF ..... Gasoline Dispensing Facility
GHG ..... Greenhouse Gas
HAP ..... Hazardous Air Pollutant
hr ..... Hour
MMBtu ..... Million British Thermal Units
mmHg ..... Millimeters of Mercury
MSDS ..... Material Safety Data Sheet
NAAQS ..... National Ambient Air Quality Standard
NESHAP ..... National Emissions Standards for Hazardous Air Pollutants
NO_x ..... Nitrogen Oxide
NSPS ..... New Source Performance Standards
NSR ..... New Source Review
PLS ..... Pregnant Leach Solution
PM ..... Particulate Matter
PM_{10} ..... Particulate Matter Nominally less than 10 Micrometers
$PM_{2.5}$ ..... Particulate Matter Nominally less than 2.5 Micrometers
PSD ..... Prevention of Significant Deterioration
Psia ..... Pounds per square Inch (absolute)
PTE ..... Potential-to-Emit
ROM ..... Run of Mine
SO_2 ..... Sulfur Dioxide
SX/EW ..... Solvent Extraction and Electrowinning
tph ..... Tons per Hour
USEPA ..... United States Environmental Protection Agency
VOC ..... Volatile Organic Compound

IX. MODELING RESULTS FROM PREVIOUS PERMIT

Nord Resources Corporation, the previous owner of JCM, conducted an Ambient Air Impact Analysis for Permit No. 46673 to demonstrate protection of the National Ambient Air Quality Standards (NAAQS). The highest predicted impact for criteria pollutants was from PM_{10}, with a predicted concentration of 83% of the NAAQS 24-hour limit. The predicted maximum concentrations of all criteria pollutants from the facility are not expected to exceed the NAAQS.

Table 4 lists the results of the analysis.

Table 4 – Results of Ambient Air Impact Analysis

Pollutant (Averaging Time)	NAAQS (µg/m^3)	Maximum Predicted Concentration (µg/m^3)	Percentage of NAAQS
PM_{10} (24-hour)	150	124	83%
PM_{10} (annual)	50	22.7	45%
SO_2 (3-hour)	1,300	47	4%
SO_2 (24-hour)	365	18.4	5%
SO_2 (annual)	80	3.2	4%
NO_x (annual)	100	5.4	5%
CO (1-hour)	40,000	845.1	2%
CO (8-hour)	10,000	671.3	7%